SECTION 9B

BRIDGE DECK REHABILITATION

1.9B.1 REQUIREMENTS

In addition to applicable construction plan requirements that are presented in Section 17 of the NJDOT Procedures Manual, the following shall apply:

1. Prior to the Preliminary Plan Submission, the following shall be performed:

   a. Review the Bridge Evaluation Survey Report or any prior Deck Evaluation Survey.

   b. Perform an on-the-site observation to determine if a Bridge Deck Evaluation Survey is warranted.

   c. Perform, if authorized, a Deck Evaluation Survey.

   d. Perform a Field Survey to determine existing/as-built geometrics and deck profile elevations at 3 meter intervals (if warranted).

   e. Contact the Bureau of Structural Engineering if it is found that the superstructure is substandard in load capacity or vertical underclearance. A determination as to whether a retrofit study is warranted shall be made.

2 The area of deck that is to be rehabilitated shall be designated as the area that is actually realized from the Deck Condition Survey or, as a minimum, fifteen (15) percent of the entire deck area.

3. Also, reference is directed to Section 12 of this Manual, “Bridge Deck Repair, Design Guidelines”, for additional guidance concerning bridge deck repair contracts.

1.9B.2 CONTRACT PAY ITEMS AND QUANTITIES

The following contract pay items and Standard Specifications references shall apply in preparing bridge deck rehabilitation projects:

1996 Standard Specifications Subsection	Contract Pay Item	Unit	Notes
----	Pavement Surface Removal	Square Meter	1
202.14 202.15	Removal of Bituminous Concrete Overlay	Square Meter	1
518.08 518.09	Repair of Concrete Deck, Type A	Square Meter	2
518.08 518.09	Repair of Concrete Deck, Type B	Square Meter	2
518.08 518.09	Repair of Concrete Deck, Type C	Square Meter	2
501.25 501.26	Reinforcement Steel in Structures	Kilogram	3
518.08 518.09	Membrane Waterproofing	Square Meter	1
404.23 404.24	Bituminous Concrete Surface Course, Mix _____	Megagram	4
518.08 518.09	Concrete Overlay Protective System, Type _____	Cubic Meter	5
518.08 518.09	Scarification	Square Meter	6
----	Modify Deck Drainage Inlets	Unit	
----	Reconstruct Concrete Headers	Linear Meter	
----	Repack Joints	Linear Meter	
----	Modify Steel Deck Joints	Linear Meter	

1996 Standard Specifications Subsection	Contract Pay Item	Unit	Notes

503.17 503.18	Structural Steel Deck Joints (kg)	Lump Sum	7
----	Remove __ by__ mm Elastomeric Joint Sealer	Linear Meter	7
501.25 __ by __ mm 501.26	Reinforced Elastomeric Expansion Dam	Linear Meter	7
501.25 ___ by ___ mm 501.26	Preformed Elastomeric Expansion Dam	Linear Meter	7

Notes

1. Pavement surface removal is scheduled for existing bridges with Bituminous or Asphaltic Concrete Overlay. Determine if waterproofing was also included and detail plans accordingly. Specifications in the Special Provisions should require that the waterproofing be removed.

2. Plans should outline Repair Areas, Repair Material, etc. when a bare concrete deck is scheduled for an overlay.

3. Reinforcement steel in structures for deck repair should be scheduled if it is determined that a reasonably large amount of Rebars will be required. If not scheduled, the Special Provisions should be modified accordingly.

4. Bituminous Concrete Surface Course is scheduled for resurfacing projects when approved prior to the Preliminary Plan Submission. Calculations must be submitted determining the influence of dead load on the existing superstructure caused by any additional thickness of B.C. overlay that is proposed.

   Thickness of B.C. Surface Course shall be noted on the Plans. Prescribed thickness for Mix I-4 or I-4 HD is 50 millimeters and for bituminous Stabilized Base Course Mix I-2, the minimum thickness is 50 millimeters. Design of an overlay in excess of this thickness and for use of a different mix shall be subject to review and recommendations by the Geotechnical Engineering Unit.

5. The standard minimum thickness adopted for concrete overlay protective systems is 32 millimeters. This thickness shall be noted on the Plans.

   An additional 10% to 20% (depending on the concrete overlay area) should be added to the estimated quantity that is based on the 32 millimeter minimum thickness. This is based on the Designer's anticipation that additional thickness may be required at some locations to achieve the proposed plan profile elevations and cross-slopes.

   In areas where additional thickness of a concrete overlay protective system is

anticipated, the total overlay thickness should be clearly prescribed on the plans. In this case, the total concrete overlay thickness should be limited to 50 millimeters maximum. If the area of additional thickness is significant (compared to total overlay area), changes in the specifications for the overlay mix design and curing time should be considered in the Special Provisions for the Project.

Situations which would produce a concrete overlay thickness in excess of 50 millimeters require special solutions. For example, if substructure settlements have resulted in significant lowering of the original plan/as-built profile elevations, jacking of the superstructure at selected locations may be considered and scheduled as a contract pay item when warranted.

Specifications provide that when a concrete overlay protective system is used as the repair material in Type B Repairs, the volume of the overlay material that is used in the repair is not to be included in the volume of the overlay measured for payment, but is measured for payment in square meters under the item “Repair of Concrete Deck, Type _____”, whichever applies.

6. Scarification is always scheduled for reconstruction projects using Concrete Overlay Protective Systems. The standard depth adopted for scarification is 6 millimeters. This depth shall be noted on the plans. Where additional depth is required, the areas and depths should be clearly prescribed on the plans.

   In the case of a newly constructed bridge deck which has not been opened to traffic or, subjected to traffic and deicing chemicals for a relatively short time, and a concrete overlay protective system is to be added, scarification may not be necessary. Cleaning of the surface by sandblasting may suffice. Provisions should be included in the Special Provisions accordingly.

7. If new preformed elastomeric joint sealer and/or reinforced elastomeric expansion dams are proposed and approved for scheduling as a contract pay item, the ideal plan would be to provide a continuous sealer across the full width of the deck slab. If this is impractical, the Structural Design Engineer shall prescribe the location of splices on the plans depending on construction traffic staging.

   Concrete overlay protective systems will not bond properly to oil, epoxy, other contaminants, and rubber (neoprene). Use of reinforced elastomeric expansion dams exclusively as the "headers" is not recommended. Other details should be considered as part of the installation.

1.9B.3 MACHINE FINISHING FOR CONCRETE DECK OVERLAY PROTECTIVE SYSTEMS

(a) At this time, concrete overlay protective systems shall include Latex Modified Concrete and Silica Fume Concrete.

(b) Specifications under Article 518.03(A) require the use of a finishing machine for placing overlays. However, the Specifications also provide that "... Hand operated vibrators and screeds may be used to place and finish small areas of work...".

In some instances small "tight" areas, unusual transitions, or other geometric constraints may preclude machine finishing. Structural Engineers should recognize adverse criteria and provisions should be made on the Plans and in the Special Provisions (Stage Construction etc.) during the design phases to minimize bridge deck areas that could preclude use of machine finishing.

(c) See Subsection 1.20.7 a. for criteria which could preclude use of machine finishing for bridge deck slab construction. These provisions shall also apply to concrete overlay protective system construction.

(d) It shall be the responsibility of the Structural Design Engineer to show the following note on the plans in bridge deck areas where adverse conditions could conceivably preclude the use of machine finishing:

NOTE:

Machine Finishing of Overlay not required, See Special Provisions.

Or...

NOTE:

Machine Finishing of Overlay not required in areas designated. See Special Provisions.

.... Whichever is applicable.

Unique specifications should be included in a project's Special Provisions.